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Ionospheric Data Report — December 1964

IONOSPHERIC DATA: BANGKOK, THAILAND

Compiled by: VICHAI T. NIMIT

Prepared for:

**U.S. ARMY ELECTRONICS LABORATORIES
FORT MONMOUTH, NEW JERSEY**

**CONTRACT DA-36-039-AMC-00040(E)
ORDER NO. 5384-PM-63-91**

**SPONSORED BY THE ADVANCED RESEARCH PROJECTS AGENCY
FOR THE
THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND**



**STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA**

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STANFORD RESEARCH INSTITUTE
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(9) Ionospheric Data Report for Dec. 1964

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BANGKOK, THAILAND

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I INTRODUCTION

Ionospheric observations are being carried out at the Laboratory of the Military Research and Development Center at Bangkok, Thailand, a joint United States-Thailand organization. A Model C-2 vertical-incidence sounder supplied and operated by the United States Army Radio Propagation Agency has been installed there. Table I gives pertinent information about the site.

Table I
VERTICAL-INCIDENCE SOUNDER SITE
AT BANGKOK, THAILAND

Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
13.73°N	100.57°E	2.5°N	169.83°E

Dip angle: 10°N

Distance from dip equator: 450 km

Equipment:

Instrument: Type C2 (automatic)

PRF: 60 pps

Frequency sweep time: 30 sec

Frequency sweep range: 1 to 25 Mc

Pulse duration: 50 μ sec

Peak pulse power: approximately 10 kw.

The cooperation and participation of staff members of the Thailand Ministry of Defense and the support of the United States Advanced Research

Projects Agency, the United States Army Electronics Laboratories, and the United States Army Radio Propagation Agency made it possible for the data presented in this report to be accumulated.

II TERMINOLOGY AND SYMBOLS

The terminology and symbols used in this data report are in accordance with the conventions established by the World Wide Soundings Committee.¹

A. TERMINOLOGY

f_oF_2
 f_oF_1
 f_oE

The ordinary wave critical frequency for the F_2 and F_1 layers and the E region, respectively.

f_oE_s

The ordinary wave top frequency corresponding to the highest frequency at which a mainly continuous E_s trace is observed.

f_bE_s

The blanketing frequency of an E_s layer, i.e., the lowest ordinary wave frequency at which the E_s layer begins to become transparent. (This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.)

f_{min}

The frequency below which no echoes are observed.

$M(3000)F_2$

The maximum usable frequency factor for a path of 3000 km for transmission by the F_2 layer.

$h' F_2$

The minimum virtual height of the ordinary wave trace for the highest stable stratification in the F region.

$h' F$

The most significant F -region virtual height parameter, that for the lowest F -region stratification. (Thus $h' F$ is identical with the current $h' F_2$ when F -region stratification is absent, i.e., at night, and with current $h' F_1$ when F_1 stratification is present.)

¹W. R. Piggott and K. Rawer, URSI Handbook of Ionogram Interpretation and Reduction of the World Wide Sounding Committee (Elsevier Publishing Company, Amsterdam, London, New York, 1961).

B. DESCRIPTIVE LETTERS

Certain effects observed on ionograms may make it difficult or impossible to obtain accurate numerical values. The descriptive letters listed below, when used alone indicate, in general, the presence of a phenomenon that may have influenced the measurement. Qualifying letters (Sec. C) indicate the nature of the uncertainty.

- A A lower thin layer present, e.g., E_c
- B Absorption in the vicinity of f_{\min}
- C Any non-ionospheric reason
- D The upper limit of the normal frequency range
- E The lower limit of the normal frequency range
- F Spread echoes present
- G Ionization density of the layer too small for measurement
- H Stratification present
- L No sufficiently definite cusp between layers of the trace
- M Ordinary and extraordinary components indistinguishable
- N Conditions such that the measurement cannot be interpreted
- O Measurement referring to the ordinary component
- R Attenuation in the vicinity of a critical frequency
- S Interference or atmospherics
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- V Forked trace
- W Echo lying outside the height range recorded
- X Measurement referring to the extraordinary component
- Y Intermittent trace
- Z Third magneto-ionic component present.

C. QUALIFYING LETTERS

- D Greater than . . .
- E Less than . . .

- I An interpolated value
- J Ordinary component characteristic deduced from the extraordinary component
- O Extraordinary component characteristic deduced from the ordinary component
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- U Uncertain numerical value
- Z Measurement deduced from the third magneto-ionic component.

D. DESCRIPTION OF STANDARD TYPES OF E_s

The eight standard types of E_s are identified by lower-case letters: f, l, c, h, q, r, a, and s. These letters suggest the corresponding names, flat, low, cusp, high, equatorial, retardation, auroral, and slant, respectively, but are not restrictive. The letter n is used to designate an E_s trace that does not correspond to one of the eight types. The classifications are:

- f An E_s trace showing no appreciable increase of height with frequency, usually relatively solid at most latitudes. (This classification may be used only at night; it appears that flat E_s traces observed in the daytime are classified according to their virtual height: h or l.)
- l A flat E_s trace at or below the normal E-region minimum virtual height in the day or below the E-region minimum virtual height at night.
- c An E_s trace showing a relatively symmetrical cusp at or below $f_o E$. (This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing—usually a daytime type.)
- h An E_s trace showing a discontinuity in height with the normal E-region trace at or above $f_o E$ and an asymmetrical cusp. (The low-frequency end of the E_s trace lies clearly above the high-frequency end of the normal E trace—usually a daytime type.)
- q An E_s trace that is diffuse and nonblanketing over a wide frequency range, the spread being most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)
- r An E_s trace that is nonblanketing over part or all of its frequency range, showing an increase in virtual height at the high-frequency

end similar to group retardation. (This is distinguished from the usual group retardation—as in the case of an occulting thick E region—by the lack of group retardation in the F traces at corresponding frequencies and the lack of complete blanketing.)

- a An E_s pattern having a well-defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. (These sometimes extend over several hundred kilometers of virtual height.)
- s A diffuse E_s trace that rises steadily with frequency, usually emerging from another type of E_s trace. (The rising trace alone is classified as s; the horizontal trace is classified separately. At high latitudes, the slant trace usually starts to rise from a horizontal E_s trace, such as l or f, at frequencies that greatly exceed the E-region critical frequency, e.g., about 6 Mc; whereas at low latitudes it usually rises from equatorial-type E_s , q, c, or h, at frequencies near the regular E critical frequency. Type s is never used to determine $f_0 E$ unless echoes clearly identifiable as E_s echoes are seen.)
- n An E trace that cannot be classified as one of the standard types. (This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.)

E. MULTIPLE REFLECTIONS FROM E_s

When the ionogram shows the presence of multiple reflections from E_s , the number of traces seen will be recorded with the letter indicating the type.

Characteristic: f_{min}

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 min

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N, Long. 100.57°E

105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	017*	E013S	017	012	012	B	B	021	020	031	028	033	C	C
2	C	C	C	C	C	C	C	C	C	C	033	039	035	035
3	018	013	012	E	E	B	B	020	028	032	038	040	040	039
4	B	B	018	016	017	B	B	024	029	037	036	046	040	C
5	C	C	C	C	C	C	C	C	C	048	042	046	053	050
6	019	016	014	C	020	C	B	031	050	C	035	055	040	036
7	023	C	C	C	C	C	C	031	037	051	044	058	047	042
8	021	017	015	019	B	B	C	031	035	048	036	040	029	037
9	E016S	014	E	E	E	E014S	B	E024S	E019S	024	033	050	039	044
10	015	017	020	023	017	019	B	029	031	C	C	C	E047C	C
11	C	C	C	C	C	C	C	C	C	032	035	035	031	032
12	024	C	016	018	015	B	B	E024S	030	034	034	026	031	024
13	C	C	C	C	C	C	C	C	C	023	023	038	036	038
14	027	C	C	C	C	C	C	C	C	023	C	036	033	034
15	022	C	019	B	B	B	B	025	027	032	033	035	039	032
16	B	017	018	B	B	B	B	022	030	036	036	036	035	035
17	023	017	016	B	B	B	B	026	029	033	039	035	034	026
18	032	020	018	B	B	B	B	023	C	036	036	E032S	035	029
19	022	018	019	018	B	013	B	025	033	033	039	048	039	047
20	025	017	017	B	B	B	B	024	030	035	040	036	047	042
21	021	017	017	018	B	B	B	C	018	032	032	034	024	035
22	E016S	014	011	E	E	B	B	E019S	019	024	034	033	035	020
23	C	C	C	C	C	C	C	C	C	025	032	036	053	040
24	020	017	016	015	B	B	B	031	C	033	035	037	029	E032S
25	019	016	014	C	015	B	B	E024S	C	E032S	033	033	E032S	C
26	018	C	015	B	B	B	B	024	029	C	032	034	037	028
27	E017S	017	B	B	B	B	B	C	028	023	032	029	023	027
28	018	017	016	014	B	B	B	021	024	023	C	033	033	039
29	C	B	B	012	B	B	B	022	018	023	024	029	033	027
30	C	C	C	C	C	C	C	C	C	020	034	035	C	032
31	C	C	C	C	C	C	C	C	C	E059C	027	C	C	C
Median Count	020 21	017 17	016 19	017 10	016 6	- 3	- -	024 21	029 20	032 25	035 28	036 30	035 28	035 26
UQ	023	017	018	018	017	-	-	027	030	035	037	040	040	039
LQ	018	015	015	014	015	-	-	022	022	024	033	033	033	029
QR	5	2	3	4	2	-	-	5	8	11	4	7	7	10

* Tabulation of 017 = 1.7 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
020	031	028	033	C	C	C	C	C	032	026	023	C	C	C	
C	C	033	039	035	035	037	021	E024S	E018S	E018S	E018S	020	E022S	E017S	020
028	032	038	040	040	039	C	037	021	E024S	026	018	022	017	033	031
029	037	036	046	040	C	C	C	C	C	C	C	C	C	C	C
C	048	042	046	053	050	C	053	038	023	022	027	022	022	022	024
050	C	035	055	040	036	C	C	C	C	028	029	C	C	C	028
037	051	044	058	047	042	052	055	029	035	025	032	026	C	029	033
035	048	036	040	029	037	039	021	029	023	E019S	019	020	E017S	C	E017S
E019S	024	033	050	039	044	047	053	037	032	030	022	027	030	024	023
031	C	C	C	E047C	C	C	C	C	C	C	C	C	C	C	C
C	032	035	035	031	032	051	025	032	023	024	025	031	033	024	023
030	034	034	026	031	024	023	032	020	032	C	025	020	032	C	C
C	C	023	038	036	038	035	034	C	C	023	021	017	023	021	026
C	023	C	036	033	034	037	033	031	027	024	016	019	020	025	025
027	032	033	035	039	032	035	018	023	019	024	025	018	025	023	021
030	036	036	035	035	035	035	035	032	023	018	020	020	C	024	023
029	033	039	035	034	026	028	033	030	020	019	020	032	030	B	024
C	036	036	E032S	035	029	035	035	035	028	022	032	032	032	026	023
033	033	039	048	039	047	039	042	035	031	032	036	040	024	028	026
030	035	040	036	047	042	035	039	022	025	021	028	028	025	033	025
018	032	032	034	024	035	034	021	E018S	017	019	017	E016S	021	019	022
019	024	034	033	035	020	021	035	030	C	C	C	C	C	C	C
C	025	032	036	053	040	050	032	C	020	018	018	C	020	C	021
C	033	035	037	029	E032S	025	024	C	021	E025S	019	020	C	C	C
C	E032S	033	033	E032S	C	034	033	C	C	C	C	C	018	019	020
029	C	032	034	037	028	034	034	031	023	E024S	022	018	024	C	C
028	023	032	029	023	027	023	033	029	032	027	020	034	027	021	C
024	023	C	033	033	039	035	032	023	C	024	018	017	017	019	017
018	023	024	029	033	027	027	031	019	024	024	017	C	C	C	C
C	020	034	035	C	032	C	024	C	019	019	C	C	C	C	C
C	C	E059C	027	C	C	C	C	C	C	C	C	C	C	C	C
029	032	C35	036	035	035	035	033	029	023	024	021	021	024	024	023
20	25	28	30	28	26	23	26	21	22	25	25	25	20	17	20
030	035	037	040	040	039	039	035	032	028	025	026	028	029	027	025
022	024	033	033	033	029	028	030	023	021	019	018	019	020	020	021
8	11	4	7	7	0	11	5	9	7	6	8	9	9	7	4

B

Characteristic: foF2

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 min

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N, Long. 100.57°E

105°E Mean Time (GMT + 7 hours)

Hour Date \	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	F	054*	063	045V	022	B	B	048	067	071	072	073	C	C
2	C	C	C	C	C	C	C	C	C	C	075	080	081	084
3	063	J064S	052	024	018	B	B	046	J061S	072	076	080	083	084
4	033	J027R	U026R	U021R	021	R	B	045	057	R	063	067	068	C
5	C	C	C	C	C	C	C	C	C	R	D070R	063	U066R	068
6	040	041	041	042	030	B	B	J049C	066	B	R	R	R	073
7	034	C	C	C	C	B	C	048	066	072	084	R	082	R
8	040	041	J045S	045	B	B	C	050	071	084	077	074	073	074
9	058	057	044	029	021	016	B	052	063	083	087	U082R	076	074
10	042	033	R	027	030	021	B	047	057	B	067	067	063	C
11	C	C	C	C	C	C	C	C	C	064	067	065	069	A
12	045	043	J044R	040	J029R	B	B	048	061	076	081	070	070H	069
13	C	C	C	C	C	C	C	C	C	C	066	068	071H	071
14	R	C	C	C	C	C	C	C	C	072	074	097	U091R	082
15	045	R	032	B	B	B	B	050	068	081	089	088	079H	072
16	U027R	025	023	B	B	B	B	048	066	079	087	077	074	072
17	042	042	027	B	B	B	B	051	068	085	089	R	072	072
18	037	032	J028R	020	B	B	B	048	C	076	089	092	075	073
19	051	054	051	045	B	J018R	B	049	064	080	081	U089R	087	087
20	042	040	045	B	B	B	B	044	057	070	068	068	070	077
21	043	046	046	035	020	B	B	C	062	081	071	064	068	071
22	031	028	031	030	018	B	B	041	056	071	072	060	059	066
23	C	C	C	C	C	C	C	C	C	068	067	058	057	058
24	031	030	029	021	J016R	B	B	043	065	075	073	066	063	060
25	026	026	U026S	027	019	B	B	046	063	069	080	077	063	D056W
26	027	026	024	J015R	B	B	B	044	057	076	075	060	058	062
27	024	020	B	B	B	B	B	043	065	075	078	071	069	067
28	024	023	023	023	B	B	B	045	059	076	C	079	070	070
29	J018R	017	019	022	J014S	B	B	042	063	083	D092S	072H	068	058
30	C	C	C	C	C	C	C	C	C	084	083	077	075	079
31	C	C	C	C	C	C	C	C	C	073	058H	055	C	
Median Count	040 22	033 21	032 20	027 17	021 12	018 3	-	048 22	063 22	076 24	075 29	072 29	070 28	072 25
UQ	045	044	045	041	026	-	-	049	066	081	084	080	075	075
LQ	031	026	026	022	018	-	-	044	059	072	071	066	065	067
QR	14	18	19	19	8	-	-	5	7	9	13	14	10	8

* Tabulation of 054 = 5.4 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Characteristic: M(3000)F2

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E105 $^{\circ}$ E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	F	305*	340	350V	360	B	B	325	280	285	265	280	C	C
2	C	C	C	C	C	C	C	C	C	C	280	295	275	275
3	325	S	380	360	340	B	B	330	S	265	270	280	300	290
4	350	J350R	U360R	U335R	345	R	B	320	280	R	260	260	265	C
5	C	C	C	C	C	C	C	C	C	R	R	290	U260R	250
6	330	330	340	350	350	B	B	U370C	320	B	R	R	R	280H
7	335	C	C	C	C	B	C	330	320	310	290	R	270	R
8	340	340	S	360	B	B	C	320	320	335	280	280	290	310
9	340	370	370	350	335	345	B	355	340	340	310	U295R	305	275
10	360	370	R	325	350	380	B	325	295	B	275	270	275	C
11	C	C	C	C	C	C	C	C	C	275	280	275	255	A
12	315	310	R	325	R	B	B	335	310	300	275	270	245H	260
13	C	C	C	C	C	C	C	C	C	C	255	255	255H	260
14	R	C	C	C	C	C	C	C	C	340	330	325	U290R	250
15	345	R	360	B	B	B	B	335	305	305	300	290	245H	260
16	U350R	360	330	B	B	B	B	360	335	330	300	270	280	260
17	325	370	395	B	B	B	B	345	330	330	330	310	R	260
18	350	350	R	350	B	B	B	360	C	350	340	290	260	240
19	330	320	340	380	B	R	B	340	330	350	335	U330R	300	310
20	335	320	345	B	B	B	B	310	280	270	275	270	270	270
21	340	345	370	375	330	B	B	C	290	285	295	255	245	270
22	330	320	345	375	370	B	B	325	300	270	255	270	275	270
23	C	C	C	C	C	C	C	C	C	265	260	270	270	270
24	330	335	370	385	R	B	B	330	310	300	275	250	235	265
25	310	300	U320S	370	330	B	B	350	355	370	320	250	240	N
26	335	320	380	R	B	B	B	365	350	335	255	260	250	250
27	320	260	B	B	B	B	B	330	320	300	300	275	270	265
28	360	340	355	385	B	B	B	360	350	350	C	270	265	260
29	R	305	340	340	S	B	B	320	340	350	S	260H	325	265
30	C	C	C	C	C	C	C	C	C	360	345	300	290	275
31	C	C	C	C	C	C	C	C	C	320	255H	255	C	
Median Count	335 21	333 20	355 17	355 16	345 9	- 2	- -	332 22	320 21	320 24	280 27	270 29	270 28	265 24
UQ	347	350	370	375	355	-	-	355	337	345	320	290	285	275
LQ	328	315	340	345	335	-	-	325	298	285	270	260	255	260
QR	19	35	30	30	20	-	-	30	39	60	50	30	30	15

* Tabulation of 305 = factor of 3.05.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

8	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
80	285	265	280	C	C	C	C	C	C	325	350	340	C	C	C
C	C	280	295	275	275	280	270	280	270	280	320	330	320	330	310
S	265	270	280	300	290	275	275	280	300	325	340	260	U340S	S	370
80	R	260	260	265	C	C	C	C	C	C	C	C	C	C	C
C	R	R	270	U260R	250	C	275	300	320	350	355	330	330	340	340
20	B	R	R	R	280H	C	C	C	C	300	330	C	C	B	335
20	310	290	R	270	R	R	290H	280	310	U330R	330	330	330	340	360
20	335	280	280	290	310	265	285	285	290	300	300	300	310	C	320
40	340	310	U295R	305	275	R	270	U300R	R	325	330	320	U315S	335	S
95	B	275	270	275	C	C	C	C	C	C	C	C	C	C	C
C	275	280	275	255	A	R	290	300	310	305	325	300	U315S	325	300
10	300	270	270	245H	260	275	280	310	320	330	340	310	U310S	C	C
C	C	255	255	255H	260	260	280	300	305	325	350	340	320	S	350
C	340	330	325	U290R	250	275	290	280	310	320	345	U320S	S	340	350
05	305	300	290	245H	260	255	265	290	280	320	325	R	320	250	350
35	330	300	270	280	260	300	275	285	310	330	360	340	335	320	340
30	330	330	310	R	260	245	265	260	290	330	355	R	R	B	350
C	350	340	290	260	240	275	275	270	255	290	300	U295R	U310R	R	R
30	350	335	U330R	300	310	U300R	260	265	285	320	U340R	340	340	U340R	340
80	270	275	270	270	270	280	310	R	335	340	340	330	350	350	R
90	285	295	255	245	270	235	280	290	295	330	330	310	330	360	350
00	270	255	270	275	270	270	300	330	C	C	C	C	C	C	C
C	265	260	270	270	270	270	280	C	310	320	320	C	330	C	320
10	300	275	250	235	265	290	275	305	340	350	350	340	C	325	330
55	370	320	250	240	N	260H	300	C	C	370	360	340	340	360	345
50	335	255	260	250	250	265	270	300	320	360	340	S	360	S	325
20	300	300	275	270	265	255	270	300	310	340	360	340	330	345	350
50	350	C	270	265	260	260	255	270	315	350	R	S	330	350	340
40	350	S	260H	325	265	265	270	285	320	340	350	A	C	C	C
C	360	345	300	290	275	280	300	310	335	335	C	C	C	C	C
C	C	320	255H	255	C	C	C	C	C	C	C	C	C	C	C
20	320	280	270	270	265	273	275	290	310	330	340	330	330	340	340
21	24	27	29	28	24	22	26	23	23	27	25	19	20	15	20
37	345	320	290	285	275	280	290	300	320	340	350	340	337	350	350
98	285	270	260	255	260	260	270	280	290	320	328	310	318	325	328
39	60	50	30	30	15	20	20	20	30	20	22	30	19	25	22

Characteristic: h'F2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N, Long. 100.57°E

105°E Mean Time (GMT + 7 hours)

Hour Date \	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1	-	-	-	-	-	-	-	L	L	319*	L	335	C	C																			
2	-	-	-	-	-	-	-	C	C	331	318	335	320	320																			
3	-	-	-	-	-	-	-	L	L	345	315	300	300	300																			
4	-	-	-	-	-	-	-	L	L	360	330	330	C																				
5	-	-	-	-	-	-	-	C	C	329	348	360	370	370																			
6	-	-	-	-	-	-	-	C	292	B	350	362	355	347H																			
7	-	-	-	-	-	-	-	L	U300L	320	335	370	350	346																			
8	-	-	-	-	-	-	-	L	L	310	320	360	330	319																			
9	-	-	-	-	-	-	-	L	279	299	303	331	315	349																			
10	-	-	-	-	-	-	-	L	L	B	339	358	L	C																			
11	-	-	-	-	-	-	-	C	C	L	340	345	378	A																			
12	-	-	-	-	-	-	-	L	L	320	339	375	389	353																			
13	-	-	-	-	-	-	-	C	C	C	L	375	398	370	349																		
14	-	-	-	-	-	-	-	C	C	280	285	300	349	354																			
15	-	-	-	-	-	-	-	L	L	321	312	339	320H	369																			
16	-	-	-	-	-	-	-	L	290	318	340	370	335	L																			
17	-	-	-	-	-	-	-	B	L	289	288	290	320	360																			
18	-	-	-	-	-	-	-	L	C	270	298	332	355	E390B																			
19	-	-	-	-	-	-	-	L	L	280	290	290	L	330																			
20	-	-	-	-	-	-	-	L	L	330	340	L	348	L																			
21	-	-	-	-	-	-	-	C	L	305	L	L	350	L																			
22	-	-	-	-	-	-	-	B	L	315	340	L	389	355																			
23	-	-	-	-	-	-	-	C	C	339	346	403	400	403																			
24	-	-	-	-	-	-	-	B	L	321L	318	390	379	400																			
25	-	-	-	-	-	-	-	L	269	271	305	A	418	355																			
26	-	-	-	-	-	-	-	L	L	299	353	400	429	400																			
27	-	-	-	-	-	-	-	L	280	301	310	319	348	368																			
28	-	-	-	-	-	-	-	L	265	273	C	349	350	370																			
29	-	-	-	-	-	-	-	L	290	273	290	270H	392H	407																			
30	-	-	-	-	-	-	-	C	C	255	280	301	348	L																			
31	-	-	-	-	-	-	-	C	C	320	340H	429	C																				
Median Count	-	-	-	-	-	-	-	-	289	305	320	345	350	355																			
UQ	-	-	-	-	-	-	-	-	9	22	26	27	27	23																			
LQ	-	-	-	-	-	-	-	-	274	280	303	320	335	347																			
QR	-	-	-	-	-	-	-	-	17	40	37	50	54	23																			

* Tabulation of 319 = 319 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	319*	L	335	C	C	C	C	C	C	-	-	-	-	-	-
C	C	331	318	335	320	318	L	L	L	-	-	-	-	-	-
L	L	L	345	315	300	300	L	L	L	-	-	-	-	-	-
L	L	L	360	330	C	C	C	C	C	-	-	-	-	-	-
C	329	348	360	370	370	C	U320L	L	280	-	-	-	-	-	-
292	B	350	362	355	347H	C	C	C	C	-	-	-	-	-	-
300L	320	335	370	350	346	315	L	L	L	-	-	-	-	-	-
L	310	320	360	330	319	335	320	L	L	-	-	-	-	-	-
279	299	303	331	315	349	L	L	L	L	-	-	-	-	-	-
L	B	339	358	L	C	C	C	C	C	-	-	-	-	-	-
C	L	340	345	378	A	325	339	L	L	-	-	-	-	-	-
L	320	339	375	389	353	340	L	300	L	-	-	-	-	-	-
C	C	L	375	398	370	340	325	U300L	U280L	-	-	-	-	-	-
C	280	285	300	349	354	352	313	L	275	-	-	-	-	-	-
L	321	312	339	320H	369	371	321	L	L	-	-	-	-	-	-
290	318	340	370	335	L	L	290	L	L	L	-	-	-	-	-
289	288	290	320	331	360	348	L	L	L	-	-	-	-	-	-
C	270	298	332	355	E390B	L	L	L	L	-	-	-	-	-	-
L	280	290	290	L	330	320	L	L	L	-	-	-	-	-	-
L	330	340	L	348	L	L	300	270	260	-	-	-	-	-	-
L	305	L	L	350	L	350	U290L	L	-	-	-	-	-	-	-
L	315	340	L	389	355	335	300	270	C	-	-	-	-	-	-
C	339	346	403	400	403	350	330	C	L	-	-	-	-	-	-
L	321L	318	390	379	400	359	350	L	250	-	-	-	C	-	-
269	271	305	A	418	355	342H	300	C	C	L	-	-	-	-	-
L	299	353	400	429	400	L	330	290	260	L	-	-	-	-	-
280	301	310	319	348	368	360	350	300	269	-	-	-	-	-	-
265	273	C	349	350	370	350	L	L	271	L	-	-	-	-	-
290	273	290	270H	392H	407	400	348	315	259	-	-	-	-	-	-
C	255	280	301	348	L	330	L	300	270	-	-	-	-	-	-
C	C	320	340H	429	C	C	C	C	C	-	-	-	-	-	-
289	305	320	345	350	355	340	323	300	270	-	-	-	-	-	-
9	22	26	27	27	23	19	16	9	10	-	-	-	-	-	-
291	320	340	370	389	370	352	344	300	275	-	-	-	-	-	-
274	280	303	320	335	347	325	307	280	260	-	-	-	-	-	-
17	40	37	50	54	23	27	37	20	15	-	-	-	-	-	-

Characteristic: h'F

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N, Long. 100.57°E

105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	300*	259	230	205	221	B	B	240	210	210	E198A	E180A	C	C	200
2	C	C	C	C	C	C	C	C	C	C	E230B	215	211	210	E200
3	260	229	225	218	245	B	B	245	230	220	E230B	220	E240B	212	200
4	E240B	260	E255A	E229B	E255B	E290B	B	250	225	E220B	E210B	205	E210B	C	200
5	C	C	C	C	C	C	C	C	C	E270B	E215B	E225B	E200B	225	200
6	260	260	240	225	245	B	B	E260B	E240B	B	E205B	E200B	E190B	E180B	200
7	259	C	C	C	C	B	C	260	E260B	B	E218B	200	B	E210B	E200
8	255	250	250	240	B	B	C	E270B	E245B	E232B	E220B	220	205	195	E200
9	240	211	211	220	248	259	B	249	229	210	200	209	E210B	200	E200
10	230	230	249	E280B	E259B	E230B	B	E259B	E230B	B	E210B	E200B	E209B	C	200
11	C	C	C	C	C	C	C	C	C	E209B	E200B	E211B	A	A	E200
12	285	261	260	259	220	B	B	259	248	228	210	203	E200A	194	E200
13	C	C	C	C	C	C	C	C	C	E200B	229	E199B	E190B	210	200
14	E311B	C	C	C	C	C	C	C	C	230	218	212	E230A	185H	180
15	239	220	240	B	B	B	B	250	235	221	210	210	210	200	185
16	E271B	250	290	B	B	B	B	265	230	220	205	200	200	185	180
17	255	219	212	B	B	B	B	248	E229B	222	E208B	E208B	200	E190A	E180
18	235	240	230	E270B	B	B	B	237	C	220	E210B	R	E218A	E209B	E200
19	240	239	250	205	B	230	B	242	250	223	225	B	E220B	E230B	E220
20	E268B	260	235	B	B	B	B	250	F230B	E215B	185H	E185B	170	E220B	210
21	235	225	210	211	245	B	B	C	230	E220B	218	198	185	175H	E170
22	250	268	248	213	233	B	B	240	233	220	210	190H	182H	190	170
23	C	C	C	C	C	C	C	C	C	E210B	205	200	190	E170B	200
24	290	260	225	220	B	-	B	U249S	231	218	E208B	189	188	E220A	200
25	300B	309	275	230	E290B	B	B	232	235	E235A	220	350	170	165	E160
26	E262S	268	220	B	B	B	B	239	230	210	200	190	183	E180A	180
27	E300S	E395B	B	B	B	B	B	248	225	200	E225A	212	E200A	E205A	E200
28	E260B	E265B	240	229	B	B	B	245	229	210	C	E220A	190	E200A	190
29	B	E350B	E318B	250	S	B	B	260	245	220	200H	200	185	E193A	E170
30	C	C	C	C	C	C	C	C	C	218	202	202	200	340	170
31	C	C	C	C	C	C	C	C	C	180H	E212A	A	C	200	170
Median Court	260 23	260 22	240 21	227 16	240 10	245 4	-	249 22	230 22	220 25	209 30	205 29	200 27	198 26	200
UQ	285	265	252	245	255	275	-	259	240	222	218	213	210	210	200
LQ	240	230	225	216	233	230	-	242	229	210	200	188	185	185	180
QR	45	35	27	29	22	45	-	17	11	12	18	13	22	25	20

* Tabulation of 300 = 300 km.

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IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	210	E198A	E180A	C	C	C	C	C	C	250	E248A	240	C	C	C
0	C	E230B	215	211	210	E205B	205	E200A	235	249	240	240	225	240	265
5	220	E230B	220	E240B	212	200	185	228H	245	238	245	230	240	250	229
E220B	E210B	205	E210B	C	C	C	C	C	C	C	C	C	C	C	C
E270B	E215B	E225B	E200B	225	C	220	245	265	239	218	209	240	228	245	
OB	B	E205B	E200B	E190B	E180B	C	C	C	C	259	250	C	C	B	252
OB	B	E218B	200	B	E210B	E220B	185H	E270A	250	245	235	225	250	240	250
5B	E232B	E220B	220	205	195	E240B	E180A	E220B	E240B	250	251	245	240	C	253
9	210	200	209	E210B	200	E240B	E235B	265	242	238	231	235	E249B	242	229
OB	E	E210B	E200B	E209B	C	C	C	C	C	C	C	C	C	C	C
E209B	E200B	E211B	A	A	E225A	E270A	E240B	243	239	228	225	260	E245B	270	
8	228	210	203	E200A	194	E200A	E239A	E250A	260	235	229	240	280	C	C
C	E200B	229	E199B	E190B	215	E220B	E240B	U250C	248	228	219	255	240	248	
230	218	212	E230A	185H	185H	E205B	190	250	229	225	240	E240A	240	235	
5	221	210	210	210	200	182H	E211A	E225A	E270A	250	229	215	250	240	248
0	220	205	200	200	185	180	E220B	E209B	221	235	210	208	225	230	240
9B	222	E208B	E208B	200	E190A	E185A	E178A	221	240	240	212	230	E262B	B	249
220	E210B	R	E218A	E209B	E240B	E230B	E250B	248	258	E275B	E290B	E300B	255	240	
0	223	225	B	E220B	E230B	E210B	E210B	E240A	E235B	240	220	226	230	238	250
OB	E215B	185H	E185B	170	E220B	210	E265B	E240A	250	240	220	230	240	231	250
0	E220B	218	198	185	175H	E180B	175H	220	E245A	240	225	239	235	212	E235A
3	220	210	190H	182H	190	178	225	220	C	C	C	C	C	C	C
C	E210B	205	200	190	E170B	200	190	C	240	243	232	C	228	C	260
11	218	E208B	189	188	E220A	A	E200A	220	A	230	210	200	C	250	E252S
5	E235A	220	350	170	165	E189B	212	C	C	213	218	210	230	231	E250B
0	210	200	190	183	E180A	190	211	E220B	229	220	219	210	220	E250B	E280S
5	200	E225A	212	E200A	E205A	E211A	E170S	208H	E260A	230	212	230	230	228	240
9	210	C	E220A	190	E200A	180	170H	230	231	220	220	205	205	239	252
5	220	200H	200	185	E193A	E170A	A	E210A	250	238	240	A	C	C	C
C	218	202	202	200	340	175	E350A	A	U240A	U250A	C	C	C	C	C
C	C	180H	E212A	A	C	C	C	C	C	C	C	C	C	C	C
0	220	209	205	200	198	200	211	225	245	240	228	230	240	240	250
2	25	30	29	27	26	24	25	23	23	27	26	23	22	19	23
0	222	218	213	210	210	213	227	240	250	249	240	240	250	245	252
9	210	200	200	188	185	181	185	220	240	235	219	210	230	231	240
1	12	18	13	22	25	32	42	20	10	14	21	30	20	14	12

Characteristic: f_{0F1}

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E

105° E Mean Time (GMT + 7 hours)

Hour Date \	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	-	-	-	-	-	-	-	L	L	U042L	L	045*	C	C	C
2	-	-	-	-	-	-	-	C	C	U045L	U044L	045	043	L	
3	-	-	-	-	-	-	-	L	L	L	U045L	044	U044L	042	
4	-	-	-	-	-	-	-	L	L	U044L	044	R	C	C	
5	-	-	-	-	-	-	-	C	C	U047L	044	U043R	U043R	046	
6	-	-	-	-	-	-	-	L	L	B	R	R	R	C	
7	-	-	-	-	-	-	-	L	L	B	043	U046L	B	044	049
8	-	-	-	-	-	-	-	B	L	L	044	044	042	L	
9	-	-	-	-	-	-	-	L	L	U044L	050	044	U045L	R	
10	-	-	-	-	-	-	-	L	L	B	U045L	U044L	U045L	C	C
11	-	-	-	-	-	-	-	C	C	L	U043L	045	A	A	042
12	-	-	-	-	-	-	-	L	L	U045L	043	045	044	U043	
13	-	-	-	-	-	-	-	C	C	C	L	044	R	044	U044
14	-	-	-	-	-	-	-	C	C	L	U044L	044	044	U045L	U044
15	-	-	-	-	-	-	-	L	L	U043L	U044L	U046L	044	045	U048
16	-	-	-	-	-	-	-	L	L	L	U046L	045	043	043	L
17	-	-	-	-	-	-	-	B	L	L	U046L	044	044	043	
18	-	-	-	-	-	-	-	L	L	U045L	U046L	R	U043R	U042	
19	-	-	-	-	-	-	-	L	C	L	U043L	R	L	045	044
20	-	-	-	-	-	-	-	L	L	L	L	B	045	044	
21	-	-	-	-	-	-	-	L	L	U043L	045H	044H	045	U045L	L
22	-	-	-	-	-	-	-	C	I	L	L	045	044	044	L
23	-	-	-	-	-	-	-	B	L	L	041	U043L	044	045	043
24	-	-	-	-	-	-	-	C	C	U042L	043	043	042	043	042
25	-	-	-	-	-	-	-	B	L	L	043	044	043	043	U043
26	-	-	-	-	-	-	-	L	L	U042L	042	A	043	043	U043
27	-	-	-	-	-	-	-	L	L	040	U045L	044	044	043	041
28	-	-	-	-	-	-	-	L	L	U040L	042	042	042	043	043
29	-	-	-	-	-	-	-	L	L	L	C	044	043	043	043
30	-	-	-	-	-	-	-	L	L	U042L	U043L	043	043	042	043
31	-	-	-	-	-	-	-	C	C	C	L	043	045	L	U042
Median Count	-	-	-	-	-	-	-	-	-	042	044	044	044	044	043
	-	-	-	-	-	-	-	-	-	10	22	27	22	24	19
UQ	-	-	-	-	-	-	-	-	-	043	045	045	045	045	044
LQ	-	-	-	-	-	-	-	-	-	041	043	043	043	043	042
QR	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2

* Tabulation of 045 = 4.5 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

8	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	U042L	L	045*	C	C	C	C	C	C	-	-	-	-	-	-
C	C	U045L	U044L	045	043	L	L	L	L	-	-	-	-	-	-
L	L	L	U045L	044	U044L	042	L	L	L	-	-	-	-	-	-
L	L	U044L	044	R	C	C	C	C	C	-	-	-	-	-	-
C	U047L	044	U043R	U043R	046	C	L	L	L	-	-	-	-	-	-
L	B	R	R	R	R	C	C	C	C	-	-	-	-	-	-
L	B	043	U046L	B	044	049	L	L	L	-	-	-	-	-	-
L	L	044	044	044	042	L	L	L	L	-	-	-	-	-	-
L	L	U044L	050	044	U045L	R	L	L	L	-	-	-	-	-	-
R	B	U045L	U044L	U045L	C	C	C	C	C	-	-	-	-	-	-
C	L	U043L	045	A	A	042	L	L	L	-	-	-	-	-	-
L	L	U045L	043	045	044	U043R	L	L	L	-	-	-	-	-	-
C	L	044	R	044	U044L	U044L	L	L	L	-	-	-	-	-	-
L	L	U044L	044	044	U045L	U044L	L	L	L	-	-	-	-	-	-
C	U043L	U044L	U046L	044	045	U048L	L	L	L	-	-	-	-	-	-
L	L	043	U046L	043	043	L	042	L	L	L	-	-	-	-	-
L	L	U045L	U046L	044	044	043	L	L	L	-	-	-	-	-	-
L	L	U043L	R	R	U043R	U042R	L	L	L	-	-	-	-	-	-
L	L	L	B	L	045	044	L	L	L	-	-	-	-	-	-
C	U043L	045H	044H	045	U045L	L	L	L	L	-	-	-	-	-	-
L	L	045	044	044	044	L	U044L	L	L	-	-	-	-	-	-
C	041	U043L	044	045	043	U042L	L	L	C	-	-	-	-	-	-
L	U042L	043	043	042	043	042	L	C	L	-	-	-	-	-	-
L	043	044	043	043	043	U043L	U043L	L	A	-	-	-	-	-	-
L	U042L	042	A	043	043	U043L	L	C	C	L	-	-	-	-	-
C	040	U045L	044	044	043	041	U041L	L	L	L	-	-	-	-	-
L	U040L	042	042	042	043	043	U042L	L	L	-	-	-	-	-	-
C	U042L	C	044	043	043	943	L	L	L	-	-	-	-	-	-
L	U043L	043	043	042	043	A	L	L	-	-	-	-	-	-	-
L	U042L	043	043	045	L	U042L	L	A	L	-	-	-	-	-	-
C	U042L	043	A	C	C	C	C	C	C	-	-	-	-	-	-
	042	044	044	044	044	043	042	-	-	-	-	-	-	-	-
	10	22	27	22	24	19	5	-	-	-	-	-	-	-	-
	043	045	045	045	045	044	044	-	-	-	-	-	-	-	-
	041	043	043	043	043	042	042	-	-	-	-	-	-	-	-
	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-

Characteristic: M(3000)F1

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute
December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E

105° E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	
1	-	-	-	-	-	-	-	L	L	U370L	L	375*	C	C	
2	-	-	-	-	-	-	-	C	C	U365L	U390L	395	410		
3	-	-	-	-	-	-	-	L	L	L	U365L	385		U390L	
4	-	-	-	-	-	-	-	L	L	U375L	380	R	C		
5	-	-	-	-	-	-	-	C	C	U365L	380	U395R	U415R	390	
6	-	-	-	-	-	-	-	L	L	B	R	R	R	R	
7	-	-	-	-	-	-	-	L	L	B	370	U400L	B	390	
8	-	-	-	-	-	-	-	B	L	L	380	400	400	420	
9	-	-	-	-	-	-	-	L	L	U380L	400	400		U385L	
10	-	-	-	-	-	-	-	L	L	B	U375L	U395L	U380L	C	
11	-	-	-	-	-	-	-	C	C	L	U385L	390	A	A	
12	-	-	-	-	-	-	-	L	L	L	U370L	400	395	400	
13	-	-	-	-	-	-	-	C	C	C	L	400	R	390	
14	-	-	-	-	-	-	-	C	C	L	U375L	395	390	U390L	
15	-	-	-	-	-	-	-	L	L	U360L	U385L	U370L	410	400	
16	-	-	-	-	-	-	-	L	L	L	380	U380L	425	440	
17	-	-	-	-	-	-	-	B	L	L	U370L	U370L	400	395	
18	-	-	-	-	-	-	-	L	C	L	U370L	R	R	U420R	
19	-	-	-	-	-	-	-	L	L	L	L	B	L	370	
20	-	-	-	-	-	-	-	L	L	U360L	400H	430H	395	U390L	
21	-	-	-	-	-	-	-	C	L	L	L	390	415	390	
22	-	-	-	-	-	-	-	B	L	L	375	U380L	390	395	400
23	-	-	-	-	-	-	-	C	C	U370L	390	380	420	395	
24	-	-	-	-	-	-	-	B	L	L	395	290	410	400	
25	-	-	-	-	-	-	-	L	L	U385L	405	A	420	370	
26	-	-	-	-	-	-	-	L	L	375	U365L	385	395	395	
27	-	-	-	-	-	-	-	L	L	U380L	405	420	425	405	
28	-	-	-	-	-	-	-	L	L	L	C	385	420	400	
29	-	-	-	-	-	-	-	L	L	U370L	U385L	420	440	440	
30	-	-	-	-	-	-	-	C	C	L	L	410	400	L	
31	-	-	-	-	-	-	-	C	C	C	U385L	-	A	C	
Median Count	-	-	-	-	-	-	-	-	-	370	380	390	400	395	
UQ LQ QR	-	-	-	-	-	-	-	-	-	10	22	26	22	24	
	-	-	-	-	-	-	-	-	-	375	385	400	120	402	
	-	-	-	-	-	-	-	-	-	365	370	380	395	390	
	-	-	-	-	-	-	-	-	-	10	15	20	25	12	

* Tabulation of 375 = factor of 3.75.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute
December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	U370L	L	375*	C	C	C	C	C	C	-	-	-	-	-	-
C	C	U365L	U390L	395	410	L	L	L	L	-	-	-	-	-	-
L	L	L	U365L	385	U390L	410	L	L	L	-	-	-	-	-	-
L	L	U375L	380	R	C	C	C	C	C	-	-	-	-	-	-
C	U365L	380	U395R	U415R	390	C	L	L	L	-	-	-	-	-	-
L	B	R	R	R	R	C	C	C	C	-	-	-	-	-	-
L	B	370	U400L	B	390	410	L	L	L	-	-	-	-	-	-
L	L	L	380	400	420	L	L	L	L	-	-	-	-	-	-
L	L	U380L	400	400	U385L	R	L	L	L	-	-	-	-	-	-
L	B	U375L	U395L	U380L	C	C	C	C	C	-	-	-	-	-	-
C	L	U385L	390	A	A	400	L	L	L	-	-	-	-	-	-
L	L	U370L	400	395	400	U415R	L	L	L	-	-	-	-	-	-
C	C	L	400	R	390	U380L	L	L	L	-	-	-	-	-	-
C	L	U375L	395	390	U390L	U380L	L	L	L	-	-	-	-	-	-
L	U360L	U385L	U370L	410	400	U360L	L	L	L	-	-	-	-	-	-
L	L	380	U380L	425	440	L	370	L	L	-	-	-	-	-	-
L	L	U370L	U370L	400	395	380	L	L	L	-	-	-	-	-	-
C	L	U370L	R	R	U420R	U270R	L	L	L	-	-	-	-	-	-
L	L	L	B	L	370	395	L	L	L	-	-	-	-	-	-
L	U360L	400H	430H	395	U390L	L	L	L	L	-	-	-	-	-	-
L	L	L	390	415	390	L	U360L	L	L	-	-	-	-	-	-
L	375	U380L	390	395	400	U400L	L	L	L	-	-	-	-	-	-
C	U370L	390	380	420	395	400	L	L	C	-	-	-	-	-	-
L	L	395	290	410	400	U340L	U375L	L	C	-	-	-	-	-	-
L	U385L	405	A	420	370	U380L	L	C	C	-	-	-	-	-	C
L	375	U365L	385	395	395	400	U370L	L	C	-	-	-	-	-	-
L	U380L	405	420	425	405	390	U370L	L	C	-	-	-	-	-	-
L	L	C	385	420	400	400	L	L	L	-	-	-	-	-	-
L	U370L	U385L	420	440	440	360	A	L	L	-	-	-	-	-	-
C	L	L	410	400	L	U420L	L	A	L	-	-	-	-	-	-
C	C	U385L	-	A	C	C	C	C	C	-	-	-	-	-	-
-	370	380	390	400	395	395	370	-	-	-	-	-	-	-	-
-	10	22	26	22	24	19	5	-	-	-	-	-	-	-	-
-	375	385	400	420	402	400	372	-	-	-	-	-	-	-	-
-	365	370	380	395	390	380	370	-	-	-	-	-	-	-	-
-	10	15	20	25	12	20	2	-	-	-	-	-	-	-	-

Characteristic: f_{OE}

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N , Long. 100.57°E
 105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	-	-	-	-	-	-	B	S	B	A	C	C	
2	-	-	-	-	-	-	-	C	C	C	B	B	B	
3	-	-	-	-	-	-	-	B	B	R	B	B	B	
4	-	-	-	-	-	-	-	B	B	B	B	B	B	
5	-	-	-	-	-	-	-	C	C	B	B	B	B	
6	-	-	-	-	-	-	-	B	B	B	B	B	B	
7	-	-	-	-	-	-	-	B	B	B	B	B	B	
8	-	-	-	-	-	-	-	B	B	B	B	B	B	
9	-	-	-	-	-	-	-	B	S	R	B	B	B	
10	-	-	-	-	-	-	-	B	B	B	R	B	C	
11	-	-	-	-	-	-	-	C	C	R	R	R	A	
12	-	-	-	-	-	-	-	B	C	C	R	B	A	
13	-	-	-	-	-	-	-	C	C	C	R	B	B	
14	-	-	-	-	-	-	-	B	B	B	R	R	R	
15	-	-	-	-	-	-	-	B	B	B	R	R	U320R	
16	-	-	-	-	-	-	-	B	B	B	R	R	R	
17	-	-	-	-	-	-	-	B	B	C	B	A	A	
18	-	-	-	-	-	-	-	B	B	B	B	B	A	
19	-	-	-	-	-	-	-	B	B	R	310	R	B	
20	-	-	-	-	-	-	-	B	R	B	B	R	B	
21	-	-	-	-	-	-	-	C	S	R	B	B	A	
22	-	-	-	-	-	-	-	B	C	C	R	U300R	B	
23	-	-	-	-	-	-	-	B	B	B	B	B	B	
24	-	-	-	-	-	-	-	B	B	A	U290R	B	A	
25	-	-	-	-	-	-	-	B	A	A	B	B	B	
26	-	-	-	-	-	-	-	B	B	B	B	B	B	
27	-	-	-	-	-	-	-	B	B	A	A	B	A	
28	-	-	-	-	-	-	-	B	A	R	C	B	B	
29	-	-	-	-	-	-	-	B	R	A	330	R	B	
30	-	-	-	-	-	-	-	C	C	A	340H	350	C	
31	-	-	-	-	-	-	-	C	C	C	S	A	B	C
Median Count	-	-	-	-	-	-	-	-	-	-	320	-	-	-
UQ	-	-	-	-	-	-	-	-	-	1	4	2	-	-
LQ	-	-	-	-	-	-	-	-	-	-	335	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	305	-	-	-
								-	-	-	30	-	-	-

* Tabulation of 305 = 3.05 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Characteristic: h'E

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E

105°E Mean Time (GMT + 7 hours)

Hour Date \	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Median Count	UQ	LQ	QR
1	-	-	-	-	-	-	-	B	115*	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
2	-	-	-	-	-	-	-	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
3	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
4	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
5	-	-	-	-	-	-	-	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
6	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
7	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
8	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
9	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
10	-	-	-	-	-	-	-	B	120	112	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B							
11	-	-	-	-	-	-	-	B	B	B	E120B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B							
12	-	-	-	-	-	-	-	C	C	119	B	122	E120B																							
13	-	-	-	-	-	-	-	B	122	115	111	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
14	-	-	-	-	-	-	-	C	C	C	119	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
15	-	-	-	-	-	-	-	C	C	120	118	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
16	-	-	-	-	-	-	-	B	B	B	E115B																									
17	-	-	-	-	-	-	-	B	B	B	119	111	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
18	-	-	-	-	-	-	-	B	B	C	119	111	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
19	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
20	-	-	-	-	-	-	-	B	B	115	B	112	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
21	-	-	-	-	-	-	-	C	112	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
22	-	-	-	-	-	-	-	B	S	118	112	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
23	-	-	-	-	-	-	-	C	C	E112S																										
24	-	-	-	-	-	-	-	B	B	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
25	-	-	-	-	-	-	-	B	B	E150S																										
26	-	-	-	-	-	-	-	B	B	B	120	112	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
27	-	-	-	-	-	-	-	B	B	B	122	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
28	-	-	-	-	-	-	-	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						
29	-	-	-	-	-	-	-	B	B	140	110	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
30	-	-	-	-	-	-	-	B	B	118	A	110	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
31	-	-	-	-	-	-	-	C	C	C	111	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110				
Median Count	-	-	-	-	-	-	-	-	-	118	115	111	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112			
UQ	-	-	-	-	-	-	-	-	-	131	120	116	122	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
LQ	-	-	-	-	-	-	-	-	-	115	112	110	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
QR	-	-	-	-	-	-	-	-	-	16	8	6	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

* Tabulation of 115 = 115 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
B	A	A	C	C	C	C	C	C	-	-	-	-	-	-
C	B	B	B	B	B	B	A	B	-	-	-	-	-	-
B	B	B	B	B	110	B	B	B	-	-	-	-	-	-
B	B	B	B	C	C	C	C	C	-	-	-	-	-	-
B	B	B	B	B	C	B	B	B	-	-	-	-	-	-
B	B	B	B	B	C	C	C	C	-	-	-	-	-	-
B	B	B	B	B	B	B	A	B	-	-	-	-	-	-
B	B	B	B	B	B	B	B	B	-	-	-	-	-	-
B	B	B	B	B	B	A	B	B	-	-	-	-	-	-
112	B	B	B	B	B	B	B	B	-	-	-	-	-	-
B	E120B	B	C	C	C	C	C	C	-	-	-	-	-	-
119	B	122	E120B	112	B	A	B	B	-	-	-	-	-	-
115	111	B	A	A	B	B	B	A	-	-	-	-	-	-
C	119	B	B	B	B	B	B	B	-	-	-	-	-	-
120	118	115	B	B	B	B	B	B	-	-	-	-	-	-
B	E115B	E125B	115	A	B	A	B	B	-	-	-	-	-	-
B	B	B	B	B	B	B	B	E133B	B	-	-	-	-	-
119	111	B	A	A	A	B	B	B	A	-	-	-	-	-
B	B	A	A	A	B	B	B	B	B	-	-	-	-	-
B	B	B	B	B	B	B	B	B	B	-	-	-	-	-
B	112	110	B	B	B	B	B	115	A	A	-	-	-	-
B	B	B	A	B	B	A	B	E120S	C	-	-	-	-	-
E112S	110	B	B	B	B	B	B	C	130	-	-	-	-	-
120	B	B	A	A	A	A	A	A	A	-	-	-	-	-
120	112	B	B	B	B	B	110	C	C	S	-	-	-	-
B	B	B	B	A	B	B	119	B	B	B	-	-	-	-
A	A	A	A	A	A	A	B	115	B	-	-	-	-	-
110	C	B	B	B	B	B	110	120	B	B	-	-	-	-
A	110	110	B	B	B	B	B	A	A	-	-	-	-	-
111	110	110	C	B	110	109	110	118	-	-	-	-	-	-
C	110	A	B	C	C	C	C	C	-	-	-	-	-	-
115	111	112	118	112	110	110	120	-	-	-	-	-	-	-
11	12	6	2	1	2	5	5	2	-	-	-	-	-	-
120	116	122	-	-	-	117	126	-	-	-	-	-	-	-
112	110	110	-	-	-	110	113	-	-	-	-	-	-	-
8	6	12	-	-	-	7	13	-	-	-	-	-	-	-

Characteristic: fbEs

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E105 $^{\circ}$ E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	B	S	B	B	B	B	B	G	G	032*	032M	036	C	C	
2	C	C	C	C	C	C	C	C	C	C	B	B	B	B	
3	B	B	022M	014M	E	B	B	G	G	G	B	G	B	B	
4	B	B	020	B	B	B	B	G	B	B	B	B	B	B	
5	C	C	C	C	C	C	C	C	B	B	B	B	B	B	
6	B	B	B	C	B	C	B	B	C	B	B	B	B	B	
7	B	C	C	C	C	C	C	B	B	B	B	B	B	B	
8	B	B	B	B	B	B	C	B	B	B	B	B	B	B	
9	S	B	E	E	E	S	B	G	G	G	B	B	B	035	
10	B	M	B	B	B	B	B	B	B	C	G	C	C	C	
11	C	C	C	C	C	C	C	C	C	G	B	G	046	A	
12	B	C	B	B	B	B	B	G	G	G	G	035	038	D032R	0
13	C	C	C	C	C	C	C	C	C	G	B	B	B	B	
14	B	C	C	C	C	C	C	C	C	032	C	G	041	036	
15	B	C	B	B	B	B	B	B	G	G	G	G	G	D034R	
16	B	B	B	B	B	B	B	B	B	B	G	G	G	G	
17	B	019M	B	B	B	B	B	B	B	B	G	G	B	037	038
18	B	B	B	B	B	B	B	B	C	B	B	D037R	D036R	D038R	0
19	B	B	B	B	B	B	B	G	G	G	B	B	B	B	
20	B	B	B	B	B	B	B	B	G	B	G	B	B	B	
21	B	E	B	B	B	B	B	C	G	B	035	B	G	B	
22	B	B	B	E	E	B	B	G	G	G	B	036	B	044	
23	C	C	C	C	C	C	C	C	G	G	B	G	B	B	
24	B	B	B	C	C	C	C	C	C	G	B	B	B	B	
25	B	B	B	C	B	B	B	B	G	G	037	039	048M	041M	
26	B	B	B	B	B	B	B	G	C	037	039	048M	034	G	
27	M	B	B	B	B	B	B	G	G	032	035	035	037	038M	
28	B	B	B	B	B	B	B	B	030	D031S	C	039	035	045	
29	B	B	B	B	S	B	B	B	G	032	G	036	036	040	
30	C	C	C	C	C	C	C	C	C	032	G	G	C	043	
31	C	C	C	C	C	C	C	C	C	C	039	C	C	C	
Median Count	-	-	-	-	-	-	-	-	-	032	035	036	037	038	
	-	1	2	1	-	-	-	-	1	7	4	8	12	12	
UQ	-	-	-	-	-	-	-	-	-	032	037	039	038	042	
LQ	-	-	-	-	-	-	-	-	-	032	034	036	036	036	
QR	-	-	-	-	-	-	-	-	-	0	3	3	2	6	

* Tabulation of 032 = 3.2 Mc.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
G	032*	032M	036	C	C	C	C	C	C	B	035M	B	C	C	C
C	C	B	B	B	B	B	G	028	B	S	S	B	S	S	S
G	G	B	G	B	G	C	033	D024R	G	B	032M	024M	032M	B	B
G	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C
C	B	B	B	B	B	C	B	G	D025R	B	B	B	B	B	B
B	C	B	B	B	B	C	C	C	C	B	B	C	C	C	B
B	B	B	B	B	B	B	G	050	B	B	B	C	C	C	B
B	B	B	B	B	B	B	M	B	B	M	021M	B	021M	C	B
B	G	B	B	B	B	B	B	B	B	B	B	B	B	S	S
B	G	C	C	C	C	C	C	C	C	C	C	B	B	B	B
C	G	B	G	046	A	B	035	B	G	B	B	C	C	C	C
G	G	G	035	038	D032R	039	D035R	034	B	C	B	B	B	B	B
C	C	G	B	B	B	B	B	B	C	C	B	024M	B	C	C
C	032	C	G	041	036	G	B	B	B	B	M	030	025M	B	B
G	G	G	G	G	D034R	G	035	033M	033M	B	B	033M	041M	B	B
B	B	G	G	G	G	G	B	G	B	B	B	019	B	B	B
B	B	G	G	B	037	038	036	B	G	024	028	-	B	B	B
C	B	B	D037R	D036R	D038R	B	B	B	B	B	B	B	B	B	B
G	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B
G	B	G	G	G	036	B	B	025	030	032	032M	035	032	B	B
G	G	B	G	B	B	044	040	G	G	C	C	C	037M	B	-
C	G	G	B	B	B	B	G	G	C	025	B	022	C	B	C
G	G	B	B	B	038	041M	046M	032M	C	039M	S	B	M	C	C
C	037	039	048M	034	G	B	G	C	C	C	C	B	B	B	B
G	G	B	G	G	035M	B	B	B	G	-	B	B	B	B	B
G	032	035	035	037	038M	043	G	G	B	G	035	B	B	B	B
030	D031S	C	039	035	045	G	G	G	G	027	028M	024M	-	B	B
G	032	G	036	036	040	036M	045M	033M	032M	028	039M	C	C	C	C
C	032	G	G	C	043	C	055M	C	031M	050M	C	C	C	C	C
C	C	C	039	C	C	C	C	C	C	C	C	C	C	C	C
-	032	035	036	037	038	039	035	033	031	028	034	027	032	-	-
1	7	4	8	12	12	6	8	8	9	6	8	8	5	-	-
-	032	037	039	038	042	043	040	034	032	032	035	032	036	-	-
-	032	034	036	036	036	036	033	029	025	027	025	024	023	-	-
-	0	3	3	2	6	7	7	5	7	5	10	8	13	-	-

Characteristic: f_{0E}

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E
 105° E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	B	S	B	B	B	B	B	G	G	032*	036M	036	C	C	
2	C	C	C	C	C	C	C	C	C	C	B	B	B	B	
3	B	B	030M	022M	E	B	B	G	G	G	B	B	G	B	
4	B	B	020	B	B	B	B	B	G	B	B	B	B	B	
5	C	C	C	C	C	C	C	C	C	B	B	B	B	B	
6	B	B	B	C	B	C	B	B	B	C	B	B	B	B	
7	B	C	C	C	C	C	C	B	B	B	B	B	B	B	
8	B	B	B	B	B	B	C	B	B	B	B	B	B	B	
9	S	B	E	E	E	S	B	G	G	G	B	B	B	035	
10	B	027M	B	B	B	B	B	B	B	C	G	C	G	C	
11	C	C	C	C	C	C	C	C	C	C	G	G	050	105M	
12	B	C	B	B	B	B	B	G	G	G	G	035	038	I032R	
13	C	C	C	C	C	C	C	C	C	C	G	G	B	B	
14	B	C	C	C	C	C	C	C	C	032	C	G	041	036	
15	B	C	B	B	B	B	B	B	G	G	G	G	G	D034R	
16	B	B	B	B	B	B	B	B	B	B	G	G	G	G	
17	B	033M	B	B	B	B	B	B	B	B	G	G	B	037	038
18	B	B	B	B	B	B	B	B	C	B	B	D037R	D036R	D038R	
19	B	B	B	B	B	B	B	G	G	G	B	B	B	B	
20	B	B	B	B	B	B	B	B	G	B	G	G	G	B	
21	B	B	B	B	B	B	B	C	G	B	035	B	036	B	
22	B	B	B	E	E	B	B	G	G	G	B	G	B	045	
23	C	C	C	C	C	C	C	C	C	C	G	B	B	B	
24	B	B	B	B	B	B	B	B	G	G	B	B	044	055M	
25	B	B	B	C	B	B	B	G	C	037	041	051M	034	G	
26	B	B	B	B	B	B	B	027	G	G	B	G	G	045M	
27	024M	B	B	B	B	B	B	B	G	032	047	045	043	056M	
28	B	B	B	B	B	B	B	B	030	D031S	C	040	035	045	
29	B	R	B	B	S	B	B	B	G	034	G	036	036	046	
30	C	C	C	C	C	C	C	C	C	035	G	C	043	043	
31	C	C	C	C	C	C	C	C	C	C	039	C	C	C	
Median Count	-	-	-	-	-	-	-	-	-	032	039	038	036	045	
1	2	2	1	-	-	-	-	1	1	7	4	8	12	13	
UQ	-	-	-	-	-	-	-	-	-	035	044	042	042	050	
LQ	-	-	-	-	-	-	-	-	-	032	036	036	036	037	
QR	-	-	-	-	-	-	-	-	-	3	8	6	6	13	

* Tabulation of 032 = 3.2 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
G	032*	036M	036	C	C	C	C	C	C	B	039M	B	C	C	C
C		B	B	B	B	B	G	028	B	S	S	B	S	S	S
G		B	G	B	G	C	033	D024R	G	B	037M	031M	038M	B	B
G		B	B	B	C	C	C	C	C	C	C	C	C	C	C
C		B	B	B	B	C	B	G	D025R	B	B	B	B	B	B
B		B	B	B	B	C	C	C	C	B	B	C	C	C	B
B		B	B	B	B	B	G	050	B	B	B	042M	C	B	B
B		B	B	B	B	B	038M	B	B	B	028M	B	027M	C	S
G		B	B	B	G	B	B	B	B	B	B	B	B	B	B
B		B	B	C	C	C	C	C	C	C	C	C	C	C	C
B		C	G	C	C	C	C	C	C	C	C	C	C	C	C
C		G	B	G	050	105M	B	037	B	G	B	B	B	B	B
G		G	035	038	D032R	040	D035R	038	B	C	B	030M	B	C	B
C		G	B	B	B	B	B	B	C	C	B	031	028M	B	B
C	032	C	G	041	036	G	B	B	B	B	029M	040M	056M	B	B
G		G	G	G	D034R	G	037	059M	046M	B	B	020	B	B	B
B		B	G	G	G	G	B	G	B	B	B	B	C	B	B
B		G	G	B	037	038	036	B	G	031	028	023	B	B	B
C		B	D037R	D036R	D038R	B	B	B	B	B	B	B	B	B	B
G		G	B	B	B	B	B	B	B	B	B	B	B	B	B
G		G	B	G	B	G	B	035	033	040M	035	033	B	B	B
G		B	035	B	036	B	B	026	030	033M	025	B	044M	B	-
G		B	G	B	045	040	G	G	C	C	C	C	C	C	C
C		G	B	B	B	B	G	C	025	B	023	C	B	C	B
G		G	B	B	044	055M	075M	045M	C	045M	S	E	022M	C	C
C	037	041	051M	034	G	B	G	C	C	C	C	C	B	B	B
G		B	G	G	045M	B	B	B	G	030	B	B	B	B	B
G		032	047	045	043	056M	049	G	G	B	G	036	B	B	B
030	D031S	C	040	035	045	G	G	G	G	030	042M	035M	021	B	B
G	034	G	036	036	046	055M	078M	057M	055M	030	056M	C	C	C	C
C	035	G	G	C	043	C	066M	C	056M	081M	C	C	C	C	C
C	C	C	039	C	C	C	C	C	C	C	C	C	C	C	C
-	032	039	038	036	045	044	037	037	033	030	036	032	032	-	-
1	7	4	8	12	13	6	9	8	9	8	10	10	6	-	1
-	035	044	042	042	050	055	055	054	050	039	039	040	038	-	-
-	032	036	036	036	037	040	034	029	028	030	028	030	027	-	-
-	3	8	6	6	13	15	21	25	22	9	11	10	11	-	-

Characteristic: h'Es

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E

105° E Mean Time (GMT + 7 hours)

Hour Date \	00	01	02	03	04	05	06	07	08	09	10	11	12	13
Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13
Date														
1	B	S	B	B	B	B	B	G	G	118*	111	110	C	C
2	C	C	C	C	C	C	C	C	C	C	B	B	B	B
3	B	B	129	105	E	B	B	G	G	G	B	B	B	G
4	B	B	112	B	B	B	B	B	G	B	B	B	B	C
5	C	C	C	C	C	C	C	C	C	B	B	B	B	B
6	B	B	B	C	B	C	B	B	B	B	B	B	B	B
7	B	C	C	C	C	C	C	B	B	B	B	B	B	B
8	B	R	B	B	B	B	C	B	B	B	B	B	B	B
9	S	~	E	E	E	S	B	G	G	G	G	G	B	G
10	B	125	B	B	B	B	B	B	B	B	G	B	C	C
11	C	C	C	C	C	C	C	C	C	G	B	G	112	109
12	B	B	B	B	B	B	B	G	G	G	G	110	110	110
13	C	C	C	C	C	C	C	C	C	C	G	B	B	B
14	B	C	C	C	C	C	C	C	C	E173G	154	G	125	112
15	B	B	B	B	B	B	B	B	G	G	G	G	G	109
16	B	B	B	B	B	B	B	B	B	B	G	G	G	G
17	B	109	B	B	B	B	B	B	B	G	G	B	103	100
18	B	B	B	B	B	B	B	B	C	B	B	105	105	100
19	B	B	B	B	B	B	B	G	G	G	B	B	B	B
20	B	B	B	B	B	B	B	B	G	B	G	G	G	B
21	B	B	B	B	B	B	B	C	G	B	120	B	108	B
22	B	B	B	E	E	B	B	G	G	B	G	B	B	102
23	C	C	C	C	C	C	C	C	C	G	G	B	B	B
24	E	B	B	B	B	B	B	B	G	G	B	B	100	100
25	B	B	B	C	B	B	B	G	E145G	128	125	112	120	G
26	B	B	B	B	B	B	B	128	G	G	B	G	100	100
27	100	B	B	B	B	B	B	G	G	110	120	100	100	098
28	B	B	B	B	B	B	B	B	132	129	C	120	125	110
29	B	B	B	B	S	B	B	B	G	108	G	130	130	100
30	C	C	C	C	C	C	C	C	C	130	G	G	140	115
31	C	C	C	C	C	C	C	C	C	C	130	119	C	
Median Count	-	-	-	-	-	-	-	-	-	128	120	111	111	102
1	2	2	1	-	-	-	-	1	2	7	5	8	14	13
UQ	-	-	-	-	-	-	-	-	-	130	139	125	125	110
LQ	-	-	-	-	-	-	-	-	-	110	116	108	105	100
QR	-	-	-	-	-	-	-	-	-	20	23	17	20	10

* Tabulation of 118 = 118 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
G	118*	111	110	C	C	C	C	C	C	B	100	B	C	C	C
C	C	B	B	B	B	B	G	105	122	B	S	B	S	S	S
G	G	B	G	B	C	C	C	125	G	B	143	130	129	B	B
G	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C
C	B	B	B	B	B	B	B	G	170	B	R	B	B	B	B
B	B	B	B	B	B	B	C	C	C	B	B	C	C	C	B
B	B	B	B	B	B	B	C	C	C	B	B	C	C	C	B
B	B	B	B	B	B	B	G	110	B	B	B	132	109	B	B
B	B	B	B	B	B	B	105	B	B	108	100	B	110	C	S
G	G	G	G	B	G	B	B	B	B	B	B	B	B	B	B
B	B	G	B	C	C	C	C	C	C	C	C	C	C	C	C
C	G	B	G	112	109	B	100	B	G	B	B	B	B	B	B
G	G	G	110	110	110	110	170	100	B	C	C	135	B	C	C
C	C	G	B	B	B	B	B	B	U102C	B	B	125	123	B	B
C	E173G	154	G	125	112	G	B	B	B	B	125	119	119	B	B
G	G	G	G	G	109	G	100	100	100	B	B	130	B	B	B
B	B	G	G	G	G	G	B	G	B	B	B	B	C	B	B
B	B	G	G	103	100	111	B	G	098	099	098	E	B	B	B
C	B	B	105	105	100	B	B	B	B	B	B	B	B	B	B
G	G	B	B	B	B	B	B	B	B	B	B	B	125	B	B
G	B	G	G	G	B	G	B	098	120	115	113	110	B	B	B
G	B	120	B	108	B	B	099	098	097	098	B	115	B	111	100
G	G	B	G	B	102	093	G	G	C	C	C	C	C	C	C
C	G	G	B	B	B	B	G	G	C	129	B	140	C	C	B
G	G	B	B	100	100	100	100	100	100	S	B	119	C	C	C
45G	128	125	112	120	G	B	G	C	C	134	C	B	B	B	B
G	G	B	G	G	100	B	B	B	G	130	B	B	B	B	B
G	110	120	100	100	098	098	G	G	B	G	100	B	B	B	B
32	129	C	120	125	110	G	G	G	G	110	129	120	118	B	B
G	108	G	130	130	100	103	110	110	110	120	108	110	C	C	C
C	130	G	140	115	115	115	112	120	110	110	C	C	C	C	C
C	C	C	130	119	C	C	C	C	C	C	C	C	C	C	C
-	128	120	111	111	102	104	105	100	106	110	110	120	119	-	-
2	7	5	8	14	12	8	9	10	10	9	10	11	7	1	1
-	130	139	125	125	110	111	117	110	120	125	129	132	125	-	-
-	110	116	108	105	100	099	100	100	100	104	100	115	100	-	-
-	20	23	17	20	10	12	17	10	20	21	29	17	15	-	-

Characteristic: Type of Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

December 1964

Observed at:

Bangkok, Thailand

Lat. 13.73° N, Long. 100.57° E
 105° E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	-	-	-	-	-	-	-	-	c	l	l	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	f4	f2	-	-	-	-	-	-	-	-	-	-
4	-	-	f	-	-	-	-	-	l	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	l	-
10	f	f	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	c4	-
12	-	-	-	-	-	-	-	-	-	-	-	c	l	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	c
14	-	-	-	-	-	-	-	-	-	h	h	-	-	c
15	-	-	-	-	-	-	-	-	-	-	-	-	-	l
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	f	-	f	-	-	-	-	-	-	-	-	l	l
18	-	-	-	-	-	-	-	-	-	-	-	l	l	l
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	c	-	l	l
22	-	-	-	-	-	-	-	-	-	-	-	-	l	l
23	-	-	-	-	-	-	-	-	-	-	-	c	-	c
24	-	-	-	-	-	-	-	-	-	-	-	-	l	l2
25	-	-	-	-	-	-	-	-	-	c	c	-	c	-
26	-	-	-	-	-	-	-	c	-	c2	c	-	c	-
27	f2	-	-	-	-	-	-	-	-	cl	l	l	l	l2
28	-	-	-	-	-	-	-	-	c	-	-	c	-	c
29	-	-	-	-	-	-	-	-	l	-	-	c	-	c
30	-	-	-	-	-	-	-	-	c	-	-	c	-	c2
31	-	-	-	-	-	-	-	-	-	-	cl	h	c	c
Median Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-	-	-

R

IONOSPHERIC DATA

Step: 1 Mc to 25 Mc in 0.5 minute

December 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
c	l	l	-	-	-	-	-	-	-	f	-	-	-	-
-	-	-	-	-	-	ch	c	c	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	f2	f2	f3	-	-
-	-	-	-	-	-	-	-	h	-	-	-	-	-	-
-	-	-	-	-	-	-	l2	-	-	-	-	-	-	-
-	-	-	l	-	-	l	-	-	f2	f	-	f	f2	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	c	c4	c	l	-	l	-	-	-	-	-	-
-	-	c	l	l	l2	h	l	-	-	-	-	f2	-	-
-	h	-	c	c	-	l2	l	l	-	-	f2	f2	f	-
-	h	-	c	l	-	l2	l	l2	-	-	f2	f2	f2	-
-	-	l	-	-	-	-	-	-	-	-	-	-	-	-
-	-	l	l	l	l	l	-	l	f2	f	-	-	-	-
-	-	l	l	l	l	l	-	l	-	-	-	-	-	-
-	-	-	-	-	-	-	l	cl	f	f	-	f	-	-
-	-	c	-	l	l	l	l	l3	l	l	f4	-	f	f
-	-	c	-	l	l	l	l	c	-	-	-	-	-	-
-	-	c	-	c	l2	l2	l	l	-	f2	-	-	-	-
c2	c	c	c	l	l	l	l	l	l	-	f2	-	-	-
-	-	cl	l	l	l2	l2	l	l	l	-	-	-	-	-
cl	l	c	c	l2	l2	l2	l	l	l	-	-	-	-	-
c	-	c	c	c	c	-	-	-	-	l2c	f2	f3	f2	-
l	-	c	c	c2	c	c3	l	l	f	f3	f3	-	-	-
c	-	-	h	c	c	c3	c3	c3	f6	-	-	-	-	-
-	-	cl	c	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MEDIAN VALUES DECEMBER 1964

Hour Local	f_{min} (Mc)	f_{oF2} (Mc)	$M(3000)F2$	$h'F2$ (km)	$h'F$ (km)	f_{oF1} (Mc)	$M(3000)F1$	f_{oE*} (Mc)	$h'E$ (km)	f_{bE} (Mc)	f_{oEs} (Mc)	$h'Es$ (km)
00	2.0	4.0	3.35	-	260	-	-	-	-	-	-	-
01	1.7	3.3	3.33	-	260	-	-	-	-	-	-	-
02	1.6	3.2	3.55	-	240	-	-	-	-	-	-	-
03	1.7	2.7	3.55	-	227	-	-	-	-	-	-	-
04	1.6	2.1	3.45	-	240	-	-	-	-	-	-	-
05	-	1.8*	-	-	245	-	-	-	-	-	-	-
06	-	-	-	-	-	-	-	-	-	-	-	-
07	2.4	4.8	3.32	-	249	-	-	-	-	-	-	-
08	2.9	6.3	3.20	289	230	-	-	118	-	-	-	-
09	3.2	7.6	3.20	305	220	4.2	3.70	115	3.2	3.2	128	-
10	3.5	7.5	2.80	320	209	4.4	3.80	111	3.5	3.9	120	-
11	3.6	7.2	2.70	345	205	4.4	3.90	112	3.6	3.8	111	-
12	3.5	7.0	2.70	350	200	4.4	4.00	118*	3.7	3.6	111	-
13	3.5	7.2	2.65	355	198	4.4	3.95	112*	3.8	4.5	102	-
14	3.5	7.1	2.73	340	200	4.3	3.95	110*	3.9	4.4	104	-
15	3.3	7.8	2.75	323	211	4.2	3.70	110	3.5	3.7	105	-
16	2.9	7.9	2.90	300	225	-	-	120	3.3	3.7	100	-
17	2.3	7.9	3.10	270	245	-	-	-	3.1	3.3	106	-
18	2.4	8.0	3.30	-	240	-	-	-	2.8	3.5	110	-
19	2.1	7.1	3.40	-	228	-	-	-	3.4	3.6	110	-
20	2.1	6.5	3.30	-	230	-	-	-	2.7	3.2	120	-
21	2.4	5.9	3.30	-	240	-	-	-	3.2	3.2	119	-
22	2.4	5.1	3.40	-	240	-	-	-	-	-	-	-
23	2.3	4.2	3.40	-	250	-	-	-	-	-	-	-

* Insufficient data for reliable median.

IONOSPHERIC DATA
 MONTHLY MEDIAN CHARACTERISTICS
 BANGKOK, THAILAND
 DECEMBER 1964

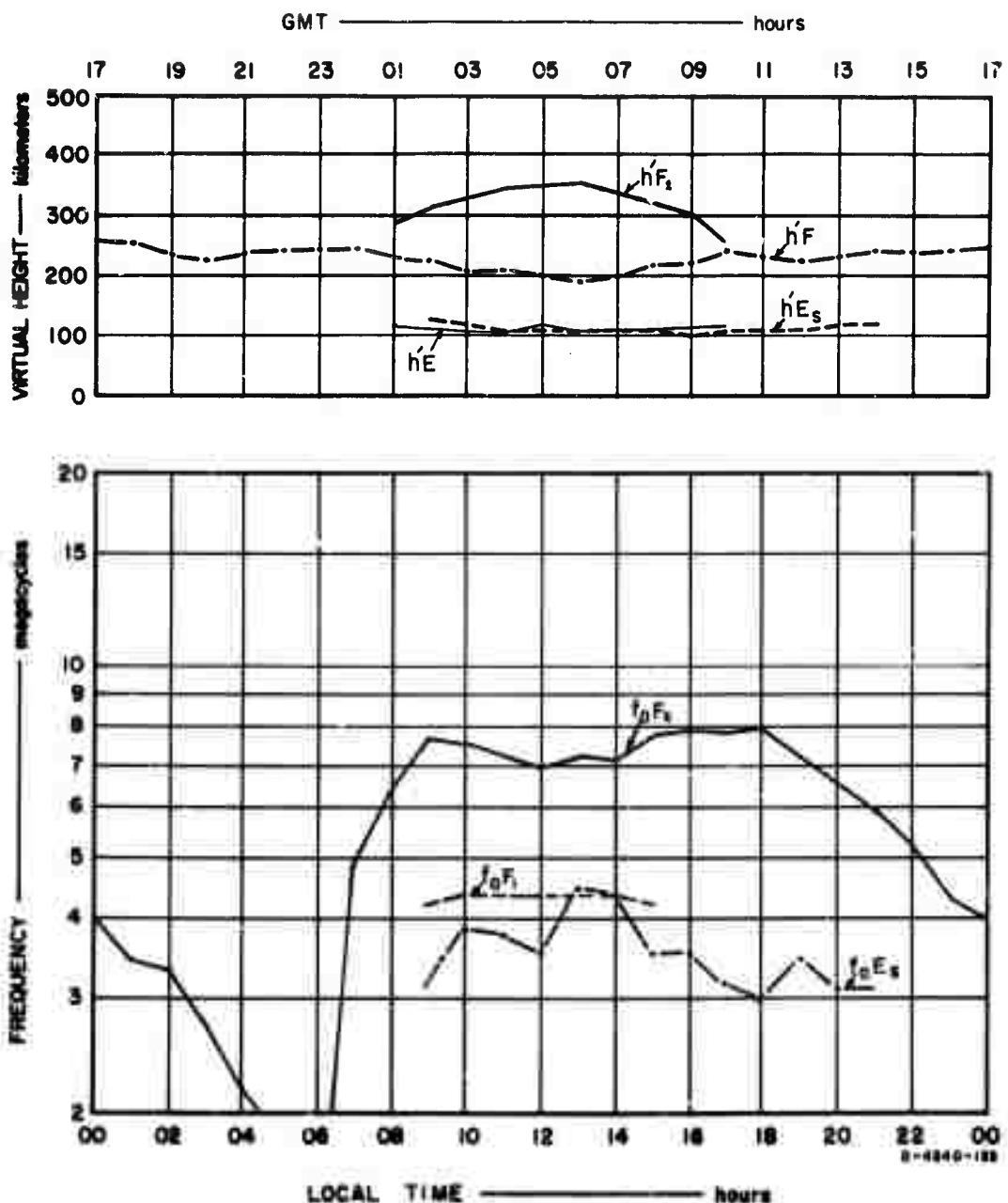


FIG. 1 SUMMARY GRAPHS

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